Muhammad Harish

Electrical Engineering Student

Muhammad Harish
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About Me

Highly motivated Electrical Engineering student with a 3.95 GPA and hands-on experience in control systems, robotics, and automation. Recognized for winning national-level competitions and granted five intellectual property rights. Skilled in embedded systems, machine learning, IoT, and PLC programming. Proven leadership in research and organizational management. Seeking to contribute to innovative engineering projects that create real-world impact.

Education

Universitas Pertamina – Electrical Engineering Sep 2021 – Aug 2025

Concentrations: Control System, Robotics, Artificial Intelligence, Automation System, and Power System Engineering || **GPA: 3.95/4.00** || Final Project: **Implementasi Reinforcement Learning pada Robot Hexapod**

Experiences

PT Inti Utama Solusindo (Pharos Group) – Contract, Mechatronics Engineer Sep 2024 – Present

- **Autonomous ASRS System**: Built a semi-autonomous storage system using LiDAR, VFDs, and microcontrollers. Designed obstacle detection and motion control logic with Python, C++, and ROS.
- **Load Cell Conveyor & Printing System**: Developed a real-time weighing and label-printing solution using industrial load cells, Arduino, RS232, and a PyQt5-based HMI.
- **Industrial Water Purification**: Designed electrical panels and automation logic based on P&ID. Programmed Siemens PLC and HMI, integrated 4–20mA sensors and Modbus RS485.
- **IoT Medical Device Integration**: Built a BLE-based system using ESP32 to connect medical devices (thermometer, BP monitor, GCU, oxymeter, etc.) for real-time patient monitoring. Used Wireshark to analyze and reverse-engineer Bluetooth protocols.

PT Pertamina Power Indonesia (Pertamina NRE) – Project Intern Apr 2024 – Aug 2024

- Developed PowerSense, an IoT-based energy monitoring system for electricity usage of solar PV systems.
- Designed a custom PCB using ESP32 and implemented Modbus RS485 communication with Schneider kWh meters.Transmitted energy data via MQTT/HTTP to a Linux-based VPS and integrated with Grafana for real-time dashboard visualization.

PT PLN (PERSERO) ULTG Bali Selatan – Intern, Electrical Protection Dept. Feb 2024 – Mar 2024

- Gained exposure to power system protection, substation operations (Gardu Induk), occupational health and safety (OHS/K3L), and PLN's workplace culture.
- Final Report: **Analysis of Differential Current Line Relay Configuration as a Protection System for High Voltage Air Line at PT PLN ULTG Bali Selatan. Grade 97.4/100.0**

Universitas Pertamina – Electronic Device Laboratory Assistant Sep 2023 – Feb 2024

- Guided more than 50 students (in total) to carry out fundamental of Electronic Device

Universitas Pertamina – Programming and Algorithms Laboratory Assistant Oct 2022 – Jan 2023

- Guided more than 40 students (in total) to carry out fundamental of Basic Programming and Algorithms

Organizations

Robotics Student Activity Unit, Universitas Pertamina – Director Dec 2022 – Oct 2024

- Overseeing a team of 17 staff and 60 members to execute 15 work programs, including Company Visits, Research, Career Information, Software Training, Robotics Competitions, Workshops, and Knowledge Sharing sessions. Oversaw and coached UAV and legged robot teams in engineering, project management, and innovation.

UAV Research Team Universitas Pertamina – Team Leader Feb 2023 – Sep 2024

- Led UAV team named SKYRONE to 1st place at KRTI Regional 2024 (Indonesian Drone Competition).
- Developed autonomous drone using Jetson Nano, Pixhawk, LiDAR, and camera for navigation and object detection.

Legged Robot Research Team Universitas Pertamina – Team Leader Dec 2022 – Jul 2024

- Led research team named BUMBLEBEE to 2nd place at KRI Regional 2024 (Indonesian Robot Competition).
- Created autonomous hexapod robot with Jetson Nano, Dynamixel servos, LiDAR, and computer vision for walking and obstacle avoidance.

Achievements

1st Winner The Most Outstanding Student - Universitas Pertamina Feb 2024

- Selected from a pool of candidates representing 15 faculties across Universitas Pertamina, this achievement recognizing exceptional academic performance, leadership, and contributions to the university community. This achievement highlights dedication, hard work, and passion for academic and personal development serving as a testament to leadership potential and positive impact within the university environment

1st Winner GEMASTIK 2023 – Kemendikbudristek Sep 2023

- Lead team and finish as 1st winner at the most prestigious IT Competition for college student in Indonesia held by The Ministry of Education, Culture, Research, and Technology.
- Paper and Project : **Roadsense: Pemetaan berbasis deep learning sebagai pendeteksi dan analisis kerusakan jalan secara real time.**

1st Winner BARONAS Paper Competition - Institut Teknologi Sepuluh Nopember Mar 2023

- Project and Paper Title: **ROAD-MAP: Pemetaan Jalan Rusak Berbasis Internet of Things dan Website dengan metode Deep Learning dan Edge Computing**

1st Winner 10th Airlangga Ideas Competition - Universitas Airlangga Oct 2022

- Project and Paper Title: **Trafo (Trash Classification and Monitoring): Sistem Pemilahan Sampah Otomatis Berbasis Computer Vision dalam Mendukung Kota dan Pemukiman Berkelanjutan**

1st Winner LKTIM UNNES - Universitas Negeri Semarang Aug 2022

- Project and Paper Title: **SEMA (Smart Energy Meter & Management): Sebagai Monitoring System Berbasis Internet of Things dalam Perekaman dan Peramalan Konsumsi Listrik**

PKM – Program Kreativitas Mahasiswa (Funded by Kemendikbudristek) Mar 2023 – Sep 2023

- **E-MA (Energy Monitoring Assistant) – PKM Karya Inovatif:** Created an IoT-based system to record and forecast household electricity consumption. **Funding: Rp8.250.000 | Selected for PIMNAS 2023**
- **MAP-Road – PKM Karsa Cipta:** Developed a road damage detection and mapping system using edge computing and deep learning. **Funding: Rp8.000.000**

Intellectual Property Rights (HKI) – Secured by Kemenkumham RI 2022 – 2024

Five innovations officially registered with the Ministry of Law and Human Rights (Kemenkumham):

- **Roadsense**: Pemetaan Berbasis Deep Learning Sebagai Pendeteksi Kerusakan Jalan Secara Realtime
- **IRIS (Integrated Shrimp Scan)**: A System For Shrimp Larvae Counter Using IoT And Computer Vision
- **EMA**: Monitoring System Berbasis Internet Of Things Dalam Perekaman Dan Peramalan Komsumsi Listrik Untuk Mendukung Bauran Energi Di Indonesia
- **MAP-Road**: Sistem Pendeteksi Dan Pemetaan Kerusakan Jalan Berbasis Edge Computing dan Deep Learning
- **WeCan-See**: Personal Assistance For Visualy Impaired People

Certifications

TOEFL ITP – Universitas Pertamina Feb 2025

- Score: 583

Udemy Course 2023 – 2025

- ROS for Beginners I – III: Basics, Motion, OpenCV, Localization, Navigation, SLAM, Web-based Navigation with ROSBridge.
- PLC Programming and Hardware Level I – III: PLC Fundamentals, Applied Logic, Process Visualization.
- Modern Computer Vision GPT, PyTorch, Keras, OpenCV4 in 2024.

Beasiswa Dicoding Academy 2022 – Dicoding Indonesia Sep 2022 – Nov 2022

- Memulai Pemrograman Dengan Python
- Belajar Dasar Visualisasi Data
- Belajar Machine Learning untuk Pemula

Hard Skills

Electrical Engineering
Programming: Python, C/C++
PLC System and Programming
Industrial Communication Protocols
Robotics and Computer Vision
Microsoft Word, Power Point, and Excel

Soft Skills

Strong Problem Solving
Quick Learner and Adaptive
Resilience
Leadership
Self-driven and independent learner
Teamwork

Interests

Robotics
Computer Vision
Autonomous System
Aerial Robotics / Drone
Industrial Automation
Renewable Energy